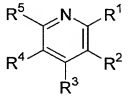
WHAT IS CLAIMED IS:

1. A non-aqueous electrolytic solution comprising an organic solvent and a lithium salt, which further contains a pyridine compound represented by the following formula (1):



(1)

wherein R^1 to R^5 each independently represents a hydrogen atom or a substituent composed of an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 2 to 20 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an aryloxy group having 6 to 10 carbon atoms, a dialkylamino group having 2 to 8 carbon atoms, a 3-thienyl group, a cyano group, a fluoro group, an alkoxycarbonyl group having 1 to 6 carbon atoms, an arylcarbonyl group having 6 to 10 carbon atoms, an alkylcarbonyl group having 1 to 12 carbon atoms, a cyanoalkyl group having 1 to 4 carbon atoms, an alkoxycarbonylalkyl group having 3 to 13 carbon atoms, a pyrrol-1-ylmethyl group, a 1-pyrrolidinyl group, a 1-piperidino group, a phenyl group, a 1H-pyrrol-1-yl group, an alkoxyalkyl group having 2 to 12 carbon atoms, a dialkylaminoalkyl group having 3 to 18 carbon atoms, an aryloxy group having 6 to 10 carbon atoms, an arylalkyl group the aryl moiety of which has 6 to 10 carbon atoms

and the alkyl moiety of which has 2 to 6 carbon atoms, an isothiocyano group, a dialkylaminocarbonyl group having 2 to 8 carbon atoms, a 5-oxazole group, a trifluoromethyl group, a 1-pyrrolidine-2,5-dione group, a 1H-pyrrol-1-ylalkyl group having 1 to 6 carbon atoms, a 4,5-dihydro-oxazol-2-yl group, a 1,3,4-oxadiazol-2-yl group, a nitro group, a 1-piperidinyl group, a 1-alkylpyrrol-2-yl group having 1 to 6 carbon atoms, a 4-1,2,3-thiadiazole group, a 2-1,3,4-oxadiazole group, a morpholino group and a 1-pyrrolin-2-yl group, with the proviso that, at least one of R^1 to R^5 represents aforesaid substituent and that, when R^1 to R^5 are a hydrogen atom or an alkyl group, at least one of R^1 to R^5 is an alkyl group having 2 or more carbon atoms and sum of the carbon atoms of R^1 to R^5 is 3 or more and that, when R^1 to R^5 each independently represents a phenyl group, two or more of R^1 to R^5 represent phenyl groups.

2. The non-aqueous electrolytic solution as claimed in claim 1, wherein R^1 to R^5 in the formula (1) each independently represents a hydrogen atom or a substituent composed of an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 3 to 20 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an aryloxy group having 6 to 10 carbon atoms and a dialkylamino group having 2 to 8 carbon atoms.

3. The non-aqueous electrolytic solution as claimed in claim 1, wherein at least one of R^1 to R^5 in the formula (1) represents an alkyl group having 1 to 20 carbon atoms with the proviso that, when R^1 to R^5 are a hydrogen atom or an alkyl group, at least one of R^1 to R^5 is an alkyl group having 2 or more carbon atoms and sum of the carbon atoms of R^1 to R^5 is 3 or more.

4. The non-aqueous electrolytic solution as claimed in claim 1, wherein, when R^1 to R^5 in the formula (1) are a hydrogen atom or an alkyl group, at least one of R^1 to R^5 is an alkyl group having 3 or more carbon atoms.

5. The non-aqueous electrolytic solution as claimed in claim 1, wherein, when R^1 to R^5 in the formula (1) are a hydrogen atom or an alkyl group, sum of the carbon atoms of R^1 to R^5 is 4 or more.

6. The non-aqueous electrolytic solution as claimed in claim 1, wherein, when R^1 to R^5 in the formula (1) are a hydrogen atom or an alkyl group, sum of the carbon atoms of R^1 to R^5 is 60 or less.

7. The non-aqueous electrolytic solution as claimed in claim 1, wherein R^1 and R^5 in the formula (1) are the aforesaid substituents.

8. The non-aqueous electrolytic solution as claimed in claim 7, wherein R^3 is also the aforesaid substituent.

9. The non-aqueous electrolytic solution as claimed in

claim 1, wherein said pyridine compound is at least one member selected from the group consisting of 2-propylpyridine, 3-propylpyridine, 4-propylpyridine, 2-isopropylpyridine, 4-isopropylpyridine, 3-butylpyridine, 4-butylpyridine, 4-isobutylpyridine, 2-methyl-5-butylpyridine, 2-tert-butylpyridine, 4-tert-butylpyridine, 2,6-di-tert-butylpyridine, 2,6-di-tert-butyl-4-methylpyridine, 2,4,6-tri-tert-butylpyridine, 2-tert-butyl-6-methylpyridine, 2-tert-butyl-4-methylpyridine, 4-tert-butyl-2-methylpyridine, 2-tert-butyl-6-isopropylpyridine, 4-(5-nonyl)pyridine, 2-pentylpyridine, 2-(3-pentyl)pyridine, 4-(3-pentyl)pyridine, 2-hexylpyridine, 4-octylpyridine, 2-undecylpyridine, 2-(1-butylpentyl)pyridine, 4-(1-propenylbutenyl)pyridine, 4-(1-butenylpentenyl)pyridine, 2,6-di-tert-butyl-4-(dimethylamino)pyridine, 2-(3-thienyl)-pyridine, 2-cyanopyridine, 2-fluoropyridine, pentafluoropyridine, 2-dimethylaminopyridine, 2-methoxypyridine, 2-pyridinecarboxylic acid ethyl ester, 2-benzoylpyridine, 2-acetylpyridine, 2-(cyanomethyl)pyridine, 4-(3-phenylpropyl)pyridine, 2-pyridylacetic acid methyl ester, 3-(pyrrol-1-ylmethyl)pyridine, 4-(1-pyrrolidinyl)pyridine, 4-piperidinopyridine, 2,4,6-triphenylpyridine, 2-(1H-pyrrol-1-yl)pyridine, 2-methoxyethylpyridine, 4-(2-diethylaminoethyl)pyridine, 2-phenoxypyridine, 3-pyridylisothiocyanate, N,N-dimethylnicotinamide, 5-(pyrid-4-

yl)oxazole, 3-trifluoromethylpyridine, 1-(3-pyridyl)-pyrrolidine-2,5-dione, 4-(1H-pyrrol-1-ylmethyl)pyridine, 3-(4,5-dihydrooxazol-2-yl)pyridine, 4-(1,3,4)oxadiazol-2-ylpyridine, 3-nitropyridine, 2,6-di(1-piperidinyl)pyridine, 3-(1-methylpyrrol-2-yl)pyridine, 3-methoxypyridine, 4-(4-pyridyl)-1,2,3-thiadiazole, 2-(3-pyridyl)-1,3,4-oxadiazole, 2,6-dimorpholinopyridine and 2-(1-pyrrolin-2-yl)pyridine.

10. The non-aqueous electrolytic solution as claimed in claim 1, wherein said pyridine compound is a pyridine compound having a bonding energy of 16 kcal/mol or more with hydrofluoric acid determined according to the following calculation method:

(method for calculating bonding energy)

A bonding energy between the pyridine compound and hydrofluoric acid is calculated according to ab initio method (program: Gaussian 94; base set: 3-21G); and the term "bonding energy" as used herein means a value obtained by summing the energy values of the pyridine compound and hydrofluoric acid determined by geometry optimization of each of them, and subtracting from the sum the energy value determined by geometry optimization of an adduct of the pyridine compound and hydrofluoric acid connecting to each other through nitrogen atom of the pyridine compound and hydrogen atom of hydrofluoric acid, that is,

(Bonding energy) = (Energy value of the pyridine compound) + (Energy value of hydrofluoric acid) - (Energy value of the adduct between the pyridine compound and hydrofluoric acid).

11. The non-aqueous electrolytic solution as claimed in claim 1, wherein said pyridine compound is contained in an amount of 0.001% by weight based on the sum of the organic solvent and the lithium salt to saturation.

12. The non-aqueous electrolytic solution as claimed in claim 1, wherein said lithium salt is a compound containing a fluorine atom or fluorine atoms.

13. A secondary battery, which comprises the non-aqueous electrolytic solution claimed in claim 1, a positive electrode and a negative electrode.

14. The secondary battery as claimed in claim 13, wherein said positive electrode comprises an active material for a positive electrode, said active material for a positive electrode being a lithium transition metal oxide.

15. The secondary battery as claimed in claim 14, wherein said lithium transition metal oxide is lithium manganese oxide or lithium cobalt oxide.

16. The secondary battery as claimed in claim 15, wherein said lithium manganese oxide is spinel type lithium manganese oxide.

17. The secondary battery as claimed in claim 15, wherein

said lithium manganese oxide is lithium manganese oxide wherein part of manganese sites are occupied by other element.

18. The secondary battery as claimed in claim 17, wherein said other element occupying the manganese sites is at least one metal element selected from the group consisting of Al, Ti, V, Cr, Fe, Co, Li, Ni, Cu, Zn, Mg, Ga and Zr.

19. The secondary battery as claimed in claim 13, wherein said negative electrode comprises an active material for a negative electrode, said active material for a negative electrode being a carbonaceous substance.

20. The secondary battery as claimed in claim 19, wherein said carbonaceous substance is graphite having a d value of lattice plane (002 plane) in X ray diffraction of 0.335 to 0.340 nm.